



## The L3Pilot Approach

From vehicle data collection to a common database

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Online-Event

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# The L3Pilot project - aims

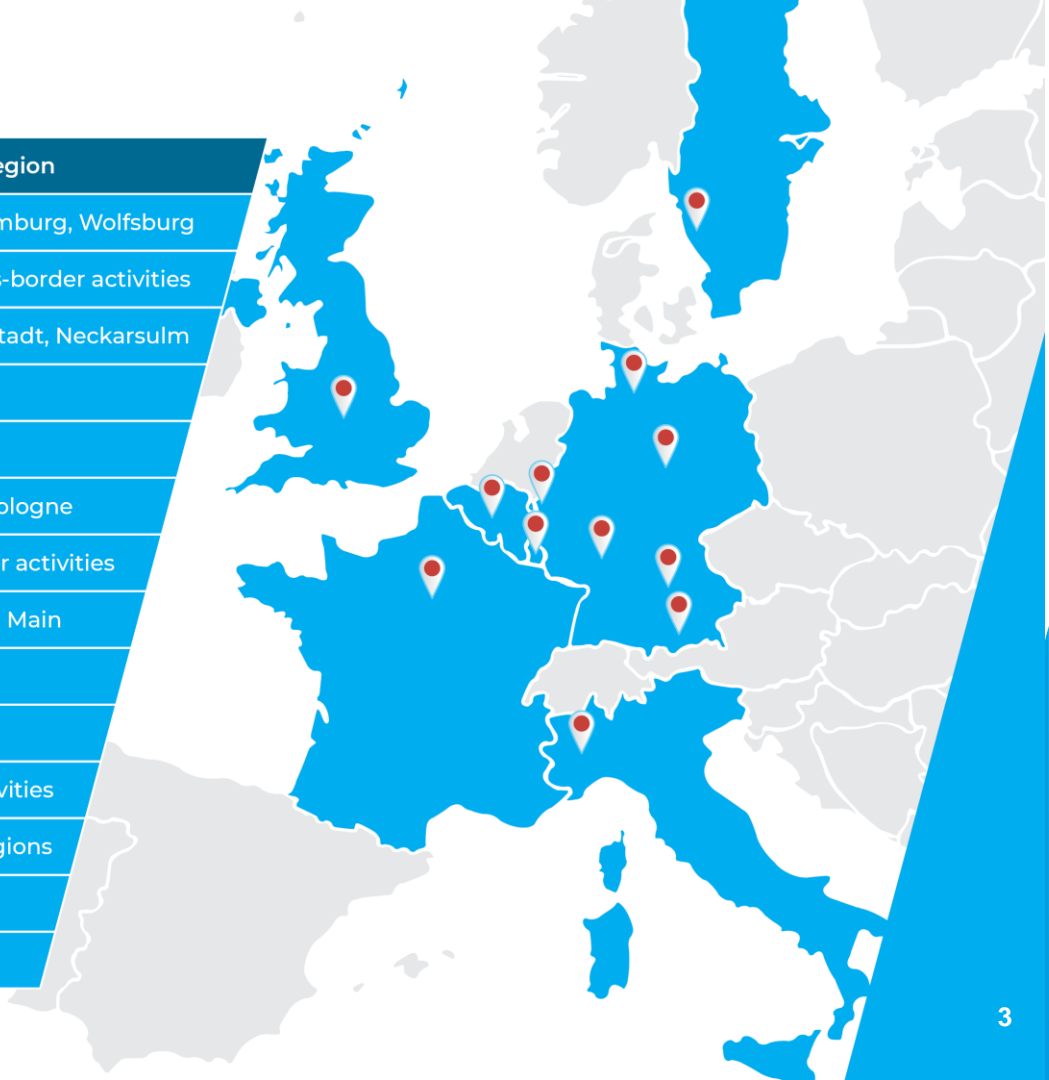
The European research project **L3Pilot**

- tests the viability of automated driving as a safe and efficient means of transportation on public roads.
- focuses on large-scale piloting of SAE Level 3 functions.
- tests the technologies over a wide range of driving situations, including parking, driving on highways and driving in urban areas.
- provides valuable data for evaluating technical aspects, user acceptance, driving and travel behaviour, as well as impact on traffic and safety.

Project duration: Sept. 2017 – Oct. 2021

# Test sites across Europe

Partner	Country	Region
Volkswagen	DE	Hamburg, Wolfsburg
Aptiv	DE, LU, FR	cross-border activities
AUDI	DE	Ingolstadt, Neckarsulm
BMW	DE	Munich
CRF	IT	Turin
FEV	DE	Aachen, Cologne
Ford	DE, BE, UK	cross-border activities
Honda	DE	Frankfurt am Main
ika	DE	Aachen
JLR	UK	Coventry
PSA	FR, DE	cross-border activities
Renault	FR	Paris and other regions
Toyota	BE	Brussels
Volvo Cars	SE	Gothenburg



# The L3Pilot project – Challenges for data analysis

For the evaluation of technical aspects of motorway functions, data from 11 different tests sites logged in 7 European countries is available.

Requirements on data processing & analysis:

- Harmonized analyses across all involved test sites.
- Keeping confidentiality of vehicle owners and avoid benchmarking:
  - All results need to be based on more than one test site.
  - Results can not be traced back to specific test sites, not even by data analysis team.

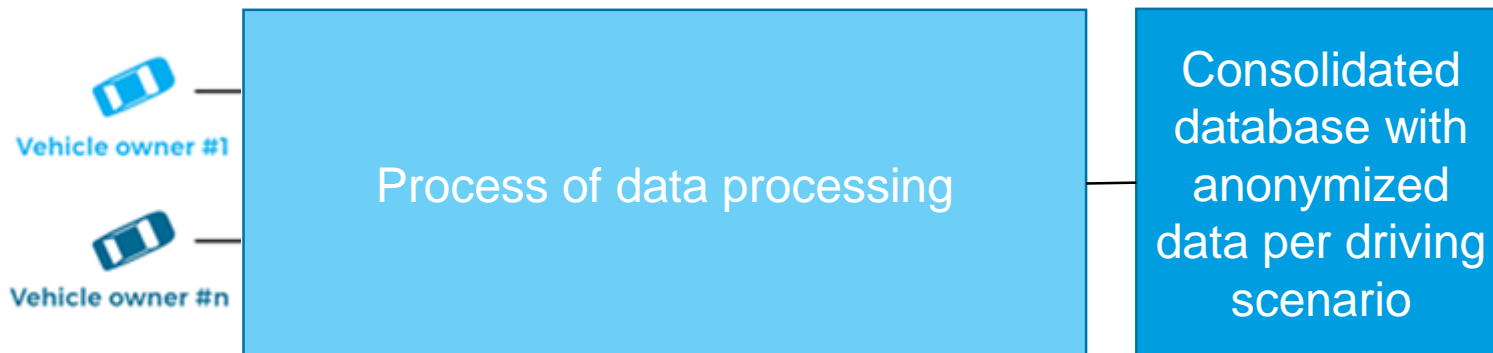
## The L3Pilot project – Solution

Research questions will be answered with the help of a database.

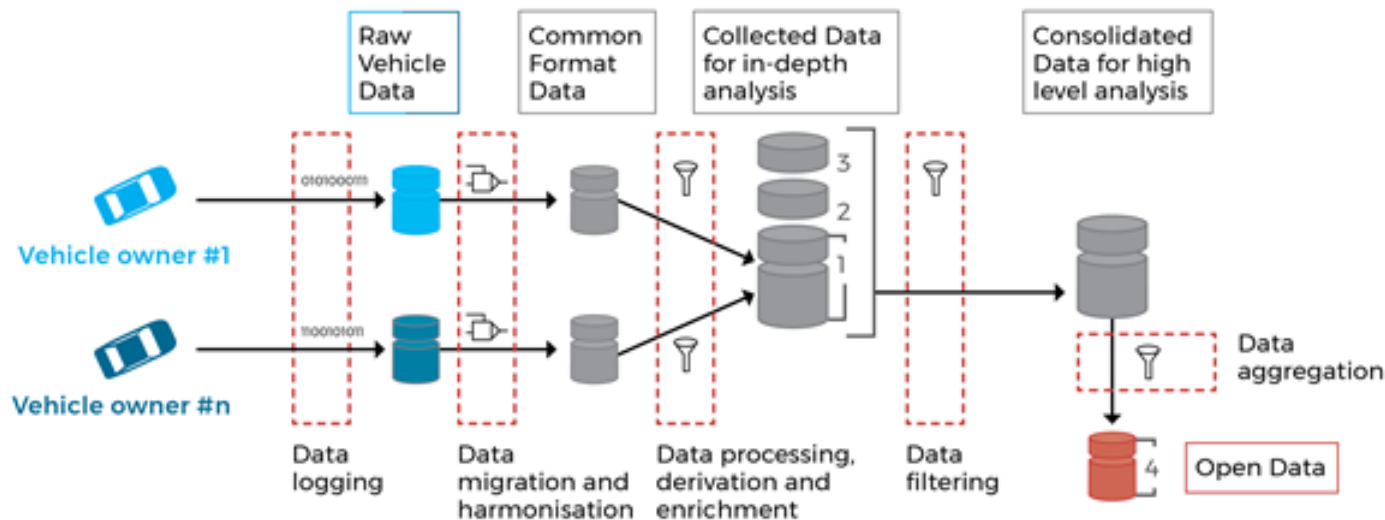
The database stores only aggregated data i.e. performance indicators.

The origin of the data i.e. vehicle owner can not be identified.

To harmonize the analysis, commonly defined driving scenarios will be used as basic units for analysis.



# The L3Pilot project – Data flow for motorway pilot



(1) Vehicle owner

(2) Selected partner

(3) Analysis team

## (1) Data processing by vehicle owners

To ensure that all motorway data can be analysed in a harmonized way each vehicle owners converts its data into a common data format.

The common data format specifies

- All required signals
- Units and resolution for continuous signals and coding for categorical signals
- Unified coordinate system e.g. for object data

Trip based data in the common data format is handed over to selected partner.

## (2) Data processing by selected partners

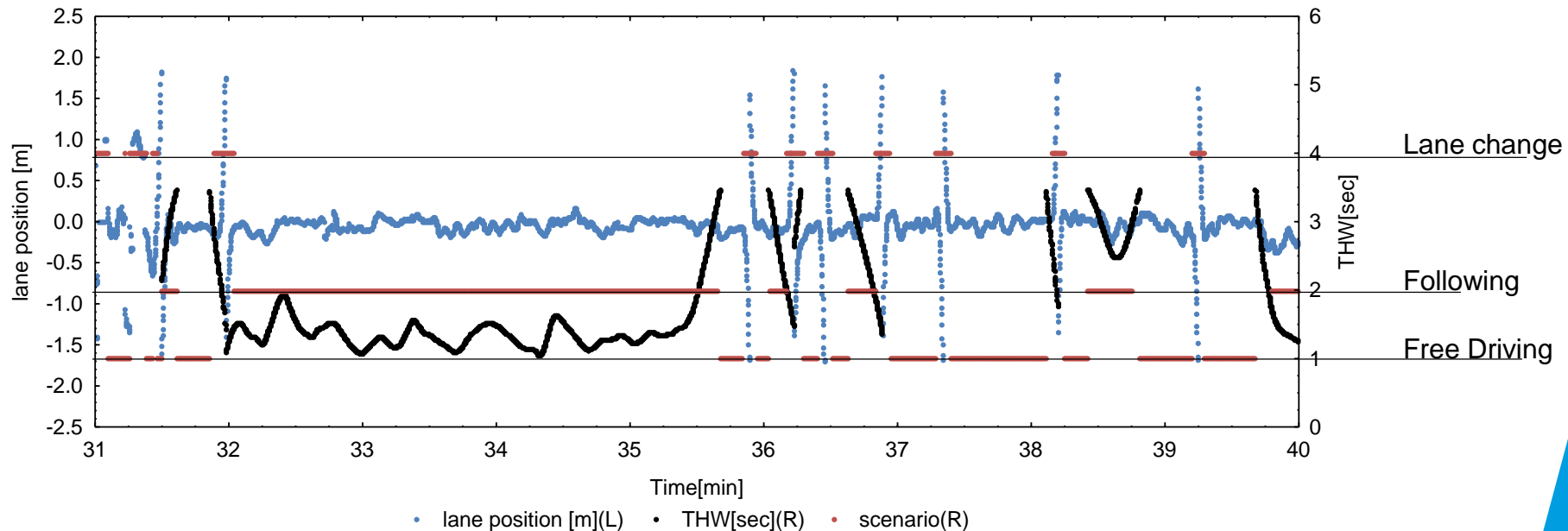
To ensure that all motorway data can be analysed in a harmonized way

- continuous trip based driving data is divided into driving scenarios, which serve as the basic unit for data analysis.
- selected partner use common scripts to process the data and derive the performance indicators needed to answer the research questions.

Performance indicators per driving scenario are uploaded anonymized into a consolidated database.



# Division into driving scenarios - example



### (3) Data analysis by analysis team

Based on the data in the consolidated database, research questions on impact of motorway functions on driving behaviour are answered by:

- Analysing performance indicators per driving scenario
- Comparing measured driving behaviour in baseline condition and with activated motorway function.

Through the consolidated database it is guaranteed:

- That results are based on all available data from all test sites.
- That data from single test sites can not be identified.

# Combined analysis - example

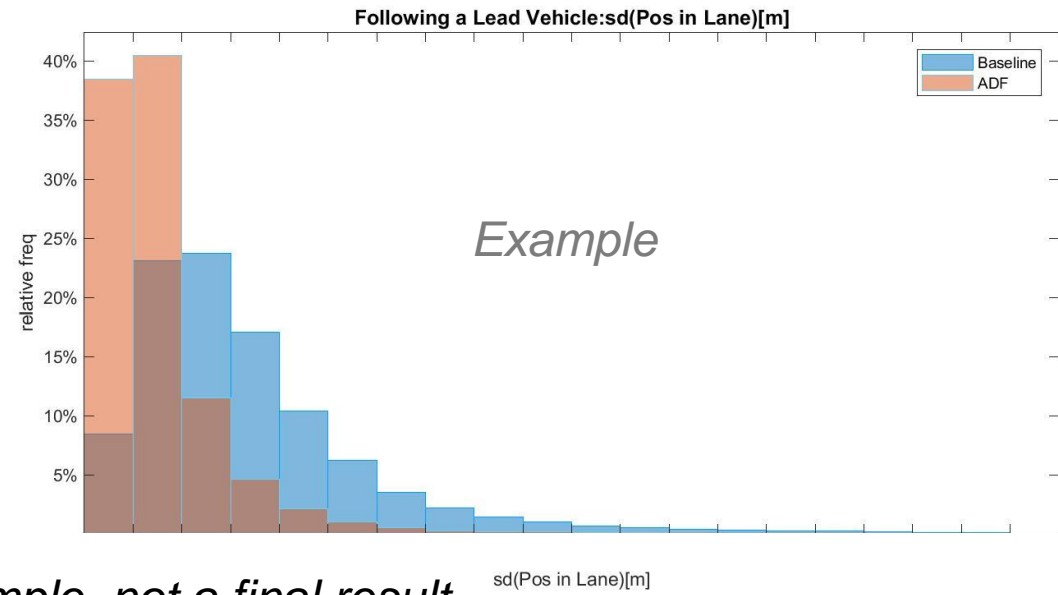
RQ-T7: What is the impact of ADF on the accuracy of driving?

Scenario:

Following a  
Lead Vehicle

Performance indicator:

Standard deviation of  
lane position



*This is an example, not a final result.*
































## Data analysis in L3Pilot – Conclusion

Implementing and testing the presented process required a considerable amount of time and work:

- Individual NDAs between vehicle owners and selected partners can take months.
- Successful conversion of logged data into common data format requires repeated and thorough testing by vehicle owners and selected partners.
- Errors in the conversion to common data format or in the common scripts sometimes become visible only after the full process of data analysis.

In the upcoming weeks, analyses of the research questions will show whether the use of driving scenarios as basic unit is a fruitful way of merging data across test sites, countries and systems.

# Thanks to all Partners in L3Pilot

OEMs	       	       
Suppliers	  	   
SMEs	 	   
Insurers	 	
		 



Thank you for your kind attention.

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